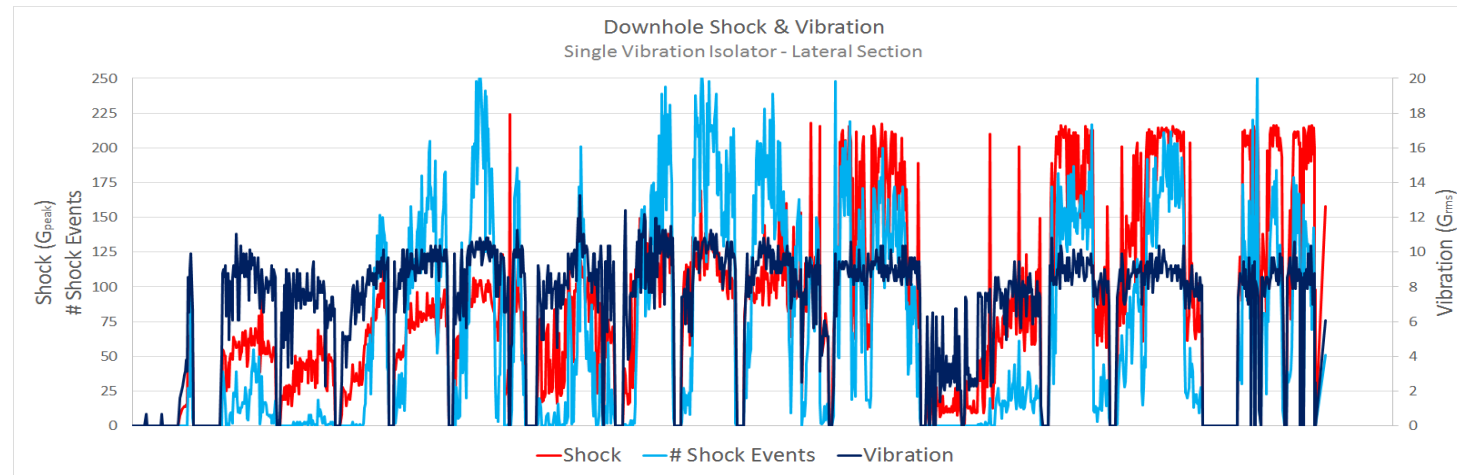


Specific MWD Improvements

- **Series Vibration Isolators (2x SRT)**
- **18% Reduced Mass of MWD**
- **20% Reduced Length of MWD**
- **Independant Module Shock Isolators**
- **Custom Elastomers Vibration Damping**
- **Rigid 4-Point Radial Centralization**
- **500lb Latching Lower End**
- **HD Rotary Shear Valve Pulsers**
- **HD BLDC Motors Laser Welded**
- **Ratchet Mount Intermodule Connections**



Shock & Vibration Mitigation

Total Directional Services has employed numerous QC processes to our MWD equipment to provide exceptional performance in high shock & vibration drilling environments.

As standard practice for all operations, we double up on Vibration Isolators (SRT). This series configuration proves to nearly eliminate high frequency shock amplitudes while significantly reducing overall vibration. The chart below illustrates the significant improvement with identical project parameters. (8.50" monobore lateral, 6.75" BHA with axial agitator (producing >200G of peak shock and a constant >8Grms of vibration. Use of this series configuration reduces these variables to <10G of peak shock and <3Grms of vibration.

